Smoking Prevalence of LSAH Participants

Each year, the American Cancer Society holds the Great American Smokeout on the third Thursday in November. On this day, smokers are encouraged to stub out their cigarettes for at least a day. More Americans quit smoking on the Great American Smokeout day than on any other day, and it is hoped that they continue to be smoke-free the rest of their lives.

Smoking is the leading cause of preventable mortality in the United States. Since the release of the first Surgeon General's Report on Smoking and Health in 1964, about 10 million people in the United States have died from smoking-related illnesses such as heart disease, lung cancer, or emphysema. Another estimated 25 million Americans will die prematurely from a smoking-related disease if current smoking trends continue.

Over the years, as the connection between cigarette smoking and serious diseases has become indisputably clear, there has been an overall decline in the smoking rate within the general population. This change can be traced back to the first Surgeon General's Report in 1964, which officially reported cigarette smoking as the cause of cancer and other serious diseases.

Subsequent acts to reduce the health hazard of smoking on society include the 1965 Federal Cigarette Labeling and Advertising Act requiring warning labels on cigarette packaging, and the prohibition of cigarette advertising on television and radio in 1969. Consequently, the smoking prevalence of adults (18 years and older) in the U.S. has declined over the years from 42.4% in 1965 to 24.1% in 1998. However, this rate seems to have reached a plateau in the 1990's, where it has hovered around the mid-20's percentage mark.

Some data on the smoking prevalence of LSAH participants have been obtained through the Lifestyle Questionnaire. This survey was developed in 1995 and sent to all astronauts and comparison participants enrolled in the study, and has been sent to subsequent classes upon their selection into the study. The data gathered from 1995 to 1999 include smoking data on 217 astronauts and 776 comparison participants (from a total of 271 astronauts and 915 comparisons at that time). The survey asks whether the respondent has ever smoked, and whether the respondent is currently smoking. Of the astronauts who responded, 16.1% of them ever smoked, and 1.4% were still smoking, while the values for the

Figure 1. Smoking Data of LSAH Participants, 1995-1999
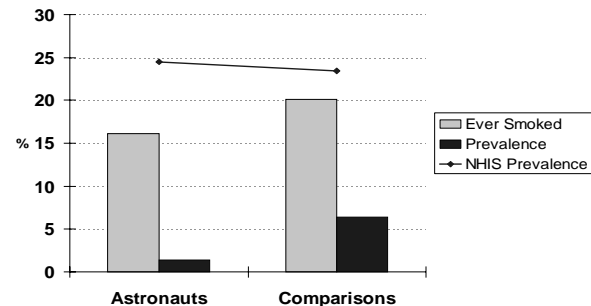
comparison participants are 20.1% and 6.4%, respectively (Figure 1). For comparison purposes, smoking data among the U.S. general population were obtained from the National Health Interview Surveys (NHIS). The smoking prevalence among U.S. adults 25 years and older from 1995 to 1999 ranged between 24.5% and 23.4%. These numbers show that compared to the

general population not only did a lower percentage of astronauts start smoking, but also that a much lower percentage of them continued to smoke. This behavior is expected because of their higher health awareness as compared to that of the general population. More surprising are the low prevalences of ever smoked

Asthma

Asthma is a chronic respiratory condition characterized by the inability to breathe properly. When a person inhales, air passes into the lungs; the lungs contain millions of small airways called bronchioles which lead to alveoli, in which oxygen and carbon dioxide are exchanged. In asthma, the bronchioles become constricted and may fill with fluid, which causes shortness of breath, wheezing and coughing.

Asthma has two stages: hyper-reactivity and inflammatory response.

Hyperreactive Response
When allergens or other irritants are inhaled, smooth muscles in the airways constrict and narrow. People without asthma breathe in deeply to relax the airways and remove the irritant from the lungs. However, when people with asthma try to take deep breaths, their airways do not relax, and

Have You Had Your Cholesterol Checked Lately?

Magazine articles and news reports galore emphasize the importance of having your cholesterol checked and getting it to a medically safe level. Here are some guidelines to give you the basic tools needed to arm yourself in the fight against high cholesterol levels and cardiovascular disease.

What is cholesterol?
Cholesterol is a waxy sub-stance found throughout the body. It is used to make cell membranes, some hormones, and vitamin D. The liver makes all of the cholesterol the body needs. Additional cholesterol is taken in through food consumption.

Why is the cholesterol level important?
The cholesterol level is important because increased levels have been associated with the development of coronary heart disease (CHD). Cholesterol buildup causes hardening and narrowing of the arteries. This decreases the flow of blood and oxygen supplied to the heart, which can result in chest pain and/or heart attack. CHD is the leading cause of death for both men and women in the United States with an estimated attributable 500,000 deaths per year. The American Heart Association (AHA) predicts that nearly $300 billion will be spent in 2001 to cover direct and indirect costs of cardio-vascular diseases and stroke in the U.S.

How do I check my choles-terol level?
Adults age 20 and older should have their cholesterol levels checked at least once every five years. This can be done by consulting your personal physician.

A common blood test used is the lipoprotein profile, which gives the levels of total cholesterol, high density lipoprotein (HDL), low density lipoprotein (LDL), and triglycerides. Knowing your total cholesterol level as well as the HDL level is important because the total cholesterol level gives a general idea about the overall cholesterol level. HDL, or 'good' cholesterol, helps keep cholesterol from building up in the arteries; therefore, a high level is desirable. LDL is the primary source of cholesterol buildup in the arteries. Triglycerides are another form of fat found in the blood.

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and currently smoking comparison participants.

The smoking trend of LSAH participants can be estimated by breaking down the preva-lence of participants who ever smoked into their selection year cohorts. This serves as an approximation of the LSAH participants' general attitude towards smoking within that time, and is compared against the smoking prevalence in the adult general population of the same period. These datapoints, along with the lines displaying the trend over time for the general population, astronauts, and comparison participants are shown on Figure 2. The astronauts parallel the smoking trend of the general popula-tion, while comparison participants show a steeper decline compared to the other groups. Note that the measure of goodness of fit (R^2) for the astronauts' and comparison participants' trendlines are 0.63 and 0.74, respectively. The trendline for the general population has an R^2 of 0.97, very close to the maximum value of 1. A maximum goodness of fit is achieved when the line is a precise representation of the data points and their trend over time. The values obtained for the LSAH participants indicate that their trendlines are not as precise a representation of smoking prevalence over time as that of the general popula-tion. This is probably a function of the small sample sizes of the LSAH cohorts, which subjects the resulting prevalences to high variability.

In general the smoking prevalence of LSAH partici-pants is much lower than that of the adult general population within the same time period. The lower smoking prevalence for astronauts as compared to the general population is expected, as by definition astronauts must be highly aware of activities affecting their health and fitness. However, the difference in smoking prevalence between the general population and the comparison participants is much greater than anticipated. When the data for LSAH participants ever smoked are broken down into cohorts, the results suggest that more comparison participants never started smoking at a higher rate as compared to the astronauts and general population. ∎

Figure 2. Smoking Trends of LSAH Participants and U.S. General Population
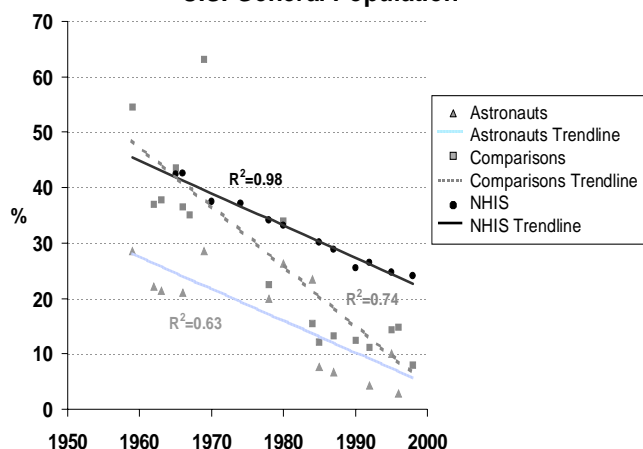
they have trouble breathing normally.

Inflammatory Response

In this stage, the immune systems respond by delivering white blood cells and other immune factors to the airways. This causes the airways to swell, fill with fluid, and produce a thick sticky mucus. The classic symptoms of an asthma attack are wheezing, shortness of breath, and a phlegmy cough. In a severe attack, breathing may become shallow, the lips and skin turn bluish, and the person may begin to lose consciousness.

Asthma affects 5% to 10% of the world's population, and more than 17 million Americans have asthma. The elderly and urban poor are at the highest risk for severe asthma and death. Highly trained athletes such as long-distance runners and swimmers are more susceptible to asthma. For example, 10% of U.S. athletes in the 1996 Olympics had asthma. Occupational exposures to a wide range of chemicals and other substances may increase the risk of asthma. Obesity and asthma have been associated, but it is not clear if one causes the other.

In a 2000 survey of the U.S. general population, 7.2% of the respondents reported having asthma (Table 1). In comparison, the prevalence rate among LSAH participants as documented in their medical records is lower: less than 4% of comparison participants were diagnosed with asthma. For the astronauts, the diagnosis rate was even lower, with less than one percent diagnosed with asthma.

What Causes Asthma?

The most common cause of asthma is allergies, referred to as allergic asthma. However, not all people with allergies have asthma and not all cases of asthma can be explained by allergic response. Exercise-induced asthma (EIA) is triggered only by exercise and it is distinct from allergic asthma. Some people have allergic asthma, some have EIA, and some have both types of asthma. EIA has the same symptoms as

allergic asthma, but it is not dangerous and does not require hospitalization. EIA occurs most commonly during intense exercise in cold dry air.

Adult-onset asthma may be caused by respiratory infections with organisms such as *Chlamydia pneumoniae*, *Mycoplasma pneumoniae*, adenovirus, and respiratory syncytial virus. Some studies suggest that antibiotic treatment in childhood is associated with development of adult-onset asthma. Other possible causes of asthma include hormone fluctuations, gastroesophageal reflux disease, sinus abnormalities, and sinusitis.

Allergic Asthma

In people who have allergic asthma, airborne allergens or other triggers start a cascade of events in the immune system that lead to inflammation and hyperreactivity in the airways. These allergens include animal dander, pollen, molds, cigarette smoke and air pollutants. The primary allergens that trigger asthma in the home are dust mites, specifically mite feces, and cockroaches. About 5% of people with asthma may have attacks induced by food allergies. The most common causes of food allergy-induced attacks are monosodium glutamate (MSG) which is found in canned soups, cheese, and some vegetables, and sulfites, which are used as a food preservative. Fifteen to twenty percent of adult-onset asthma cases are caused by occupational exposure to chemical triggers such as chlorine and ammonia. Other asthma attack triggers include cold air, thunderstorms, extreme emotion, and certain medications (*e.g.*, aspirin and beta-blockers).

How Serious Is Asthma?

Asthma can be a debilitating chronic disease, although it may have long periods of remission. Despite an increase in the U.S. death rate from asthma between 1977 and 1994 (from 0.5 to 1.2 per 100,000 in whites and from 1.5 to 3.7 per 100,000 in African Americans), death from asthma is rare when the disease is properly treated. In mild to moderate cases, asthma may improve over time, and many adults become symptom free. However, in severe persistent cases (about 10%), progressive decrements in lung function may occur even in patients who receive aggressive treatment.

Treatment

There are two types of basic treatments for asthma, preventive and reactive. Preventive elements include avoiding exposure to known allergens, home monitoring of lung function, and long-term control medications. Long-term control medications (bronchodilators and corticosteroids) are taken regularly to prevent or reduce inflammation in the airways. These medications decrease the risk of having an asthma attack. Reactive treatments involve use of quick-relief medications to open airways rapidly when symptoms of an asthma attack occur. An acute asthma attack may require hospitalization so that medications can be given frequently along with oxygen.

Although asthma is a serious condition, patients who self-manage their asthma have fewer hospitalizations, and a better quality of life than those who rely on emergency visits to a physician or hospital to control symptoms. ∎

Table 1. Prevalence of Asthma Diagnosis

	Astronauts (N=312)	Comparison Participants (N=929)	U.S. General Population* (N=181,914)
Asthma	2 (0.64%)	36 (3.9%)	(7.2%)

*From: Self-reported Asthma Prevalence Among Adults – United States, 2000. Morbidity and Mortality Weekly Report, August 17, 2001, Vol. 50, No. 32, Centers for Disease Control and Prevention.

What should my cholesterol level be?

Table 1 gives the current standards used to classify cholesterol levels. Of the 240 NASA astronauts receiving physical exams in 2000, 23 (9.6%) had at least one exam with an undesirable total cholesterol level; 78 astronauts (33%) had borderline total cholesterol levels. Regarding HDL, 36 (15%) of the same 240 astronauts had undesirable HDL levels; 134 (56%) had borderline HDL levels. However when total cholesterol and HDL levels were examined together, none of the astronauts had undesirable levels for both values. For the U.S. general population, estimates by the AHA show that over 60 million U.S. adults (20 years of age and older) have borderline total cholesterol levels while over 40 million have undesirable levels.

Is it possible to lower my cholesterol level?
Sure! The build up of cholesterol in the arteries can be slowed or decreased by lowering of the cholesterol level. The National Heart, Lung, and Blood Institute reported a decrease in the U. S. average blood cholesterol level between 1978 and 1990 from 213 mg/dL to 205 mg/dL.

The total cholesterol level can be reduced or maintained by reducing the consumption of

saturated fat and cholesterol, maintaining a healthy weight, and participating in regular physical activities. Saturated fats can be found in foods such as meats, dairy products, and vegetable oils. Unfortunately, there are certain factors affecting your cholesterol level that are beyond your control. Examples include increasing age, postmenopausal status in women, and genetic factors. In

Table 1. Cholesterol Standards

Category	Total Cholesterol mg/dL	HDL mg/dL
Desirable	< 200	60+
Borderline	200-239	40-59
Undesirable	240+	< 40

some instances, drug treatment can be used to supplement cholesterol-lowering lifestyle changes.

Appropriate lifestyle changes to maintain a desirable cholesterol level are specific to each individual. Consultation with your family physician is warranted before instituting these changes into your lifestyle. Your physician can help you set your goals and arm you in the battle against cardiovascular disease. ∎

Cold and Flu Facts

As we head towards cooler temperatures we should also prepare for cold and influenza season. This is because time spent indoors results in more contact with other people, and hence a higher chance of infection by the cold and flu viruses. Dry air also dries nasal passages, causing them to be more susceptible to the viruses.

Both the common cold and the flu may last up to 14 days. However, the flu has more severe potential complications than the common cold. Drinking plenty of fluids and getting lots of rest is still the best treatment for both illnesses. Over the counter remedies (*e.g.*, ibuprofen, nasal decongestants) can also be used to ease symptoms of the cold and flu. The use of antibiotics by cold and flu sufferers is only warranted when secondary bacterial infections develop. Antibiotics are not effective against the cold virus and have the

unintended consequence of breeding resistant strains of bacteria. Currently, antiviral medications against influenza are available. However, these antivirals help only when taken within 48 hours of illness. If the symptoms have not abated in 3 days, a visit to the doctor is recommended to treat any secondary bacterial infections that may have developed.

Some steps to avoid the common cold and flu include washing your hands frequently, avoiding crowds, and living a healthy lifestyle. Another preventive measure is the annual flu vaccine, which is usually given between October and December. The vaccine helps your body build immunity to the influenza virus. Getting a vaccine does not guarantee total immunity against infection, but it lessens the severity of influenza and protects against serious complications. ∎